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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,925	05/09/2001	Tak Kin Chu	82528	7226

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EXAMINER	
KIELIN, ERIK J	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/853,925	CHU ET AL.	
	Examiner	Art Unit	
	Erik Kielin	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-21 and 29-36* is/are pending in the application.

4a) Of the above claim(s) *none* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29,34 and 35* is/are rejected.

7)☒ Claim(s) *15-21,30-33 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/20/4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action responds to the Amendment filed 20 May 2004.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claim 29 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of U.S. Patent No. 6,083,818 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon** et al.).

Claim 3 of the '**818** patent includes a barrier layer including a monolayer of strontium atoms with a conductor deposited thereon.

Claim 3 does not recite that the conductor is single crystal transition metal.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 3 of '**818** patent to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

3. Claim 29 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 10 of U.S. Patent No. 6,211,066 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon** et al.).

Claim 10 of the '**066** patent includes a barrier layer including a monolayer of barium atoms with a conductor deposited thereon.

Claim 10 does not recite that the conductor is single crystal transition metal.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 10 of '**066** patent to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

4. Claims 29, 34, and 35 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3 and 7 of U.S. Patent No. 6,566,247 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon** et al.).

Claim 3 of the '**247** patent includes a barrier layer including a mixed monolayer of metal atoms selected from the group consisting of barium, cesium, strontium, and rubidium with a conductor deposited thereon. Claim 7 recites that the conductor is copper.

Claim 3 does not recite that the conductor is single crystal transition metal of copper, as further limited by instant claim 7.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 3 of '**247** patent to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

5. Claims 29, 34, and 35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15 and 20 of copending Application No. 09/137,086 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon** et al.). This is a provisional obviousness-type double patenting rejection.

Claim 15 of the '**086** application includes a barrier layer including a monolayer of cesium atoms with a conductor deposited thereon.

Claim 15 does not recite that the conductor is single crystal transition metal of copper -- as further limited by claim 20.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 15 of '**086** application to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

Response to Arguments

6. Applicant's arguments filed 11 August 2004 have been fully considered but they are not persuasive.

Applicant argues that none of the double patenting rejections is proper "because both Uzoh and Simon teach away from forming a single crystal transition metal on the barrier film, as is required by claims 29, 34 and 35 of the present application. Examiner respectfully disagrees. As noted above in the rejection, each of Uzoh and Simon expressly teach the benefits of forming a single crystal transition metal --specifically copper metal-- on the barrier layer (called "liner layer") to improve the structural integrity of the interfaces between metal layers. Accordingly, the argument is not found persuasive.

To the extent that Applicant is arguing that a seed layer intervenes between the barrier/liner layer of Uzoh and the single crystal copper, the Uzoh Fig. 2(b) clearly show that there exists no seed layer between the single crystal copper **34** and the barrier/liner layer **30**

erroneous. Similar rebuttal exists for the Simon reference. In this regarding, the instant claims make no requirement that there exist no seed layer or that there even be direct contact in the final product between the barrier/liner layer and the single crystal transition metal. Accordingly, the argument is not found persuasive because the arguments are drawn to unclaimed subject matter.

The arguments presented at page 4 regarding the advantages disclosed in the specification are noted but, again, these features are not claimed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Neither Uzoh nor Simon are required to deposit their liner layers on Ba, Sr, or Cs for the combinations to be proper. If they were to, then each reference would provide a proper rejection under 35 USC 102 --not under obviousness-type Double Patenting. Each of Uzoh and Simon teach the benefits of single crystal copper that has no bearing on the barrier layer material used. In other words the benefit of single crystal copper exists regardless of the barrier layer. In this regard, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Applicant's argument regarding that which one of ordinary skill would look to is noted. The argument is not found persuasive because it is merely a conclusory observation of Applicant's Representative. It is not evidence regarding the level of ordinary skill and that which one of ordinary skill would do. Moreover, the modification is proper for the reasons indicated in the rejection. The benefits of single crystal copper (a transition metal) are made clear by each of

Uzoh and Simon. Accordingly, one of ordinary skill would see the benefit of forming single crystal copper on the barrier layers of the applied references as is done on the barrier layers of each of Uzoh and Simon.

Allowable Subject Matter

7. Claims 15-21, 30-33, 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Erik Kielin
Primary Examiner
11 August 2004